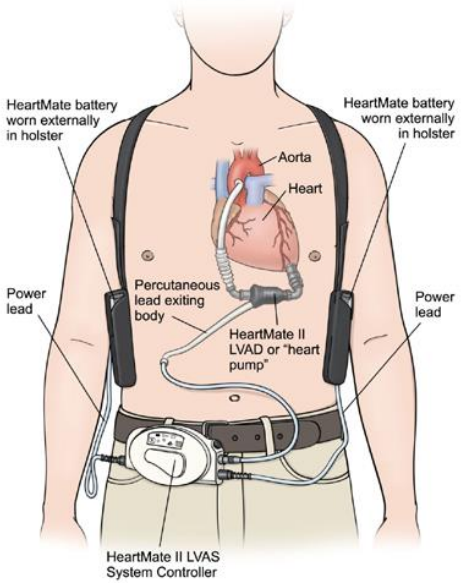
Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

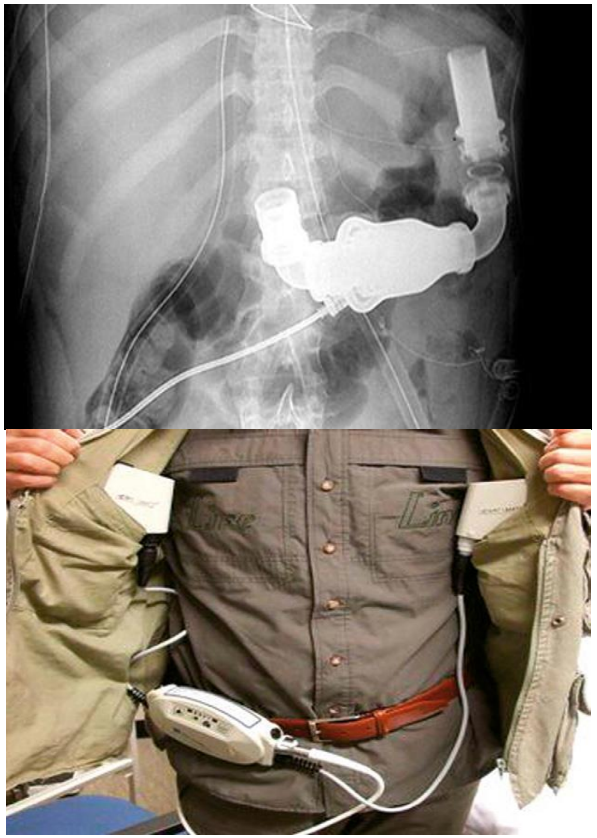
Left ventricular assist devices (LVAD) in the treatment of end-stage heart failure

Mattias Neyt, Roos Leroy, Carl Devos, Hans Van Brabandt

Background

- End-stage heart failure
  - Heart transplantation
  - LVAD
  - OMT*

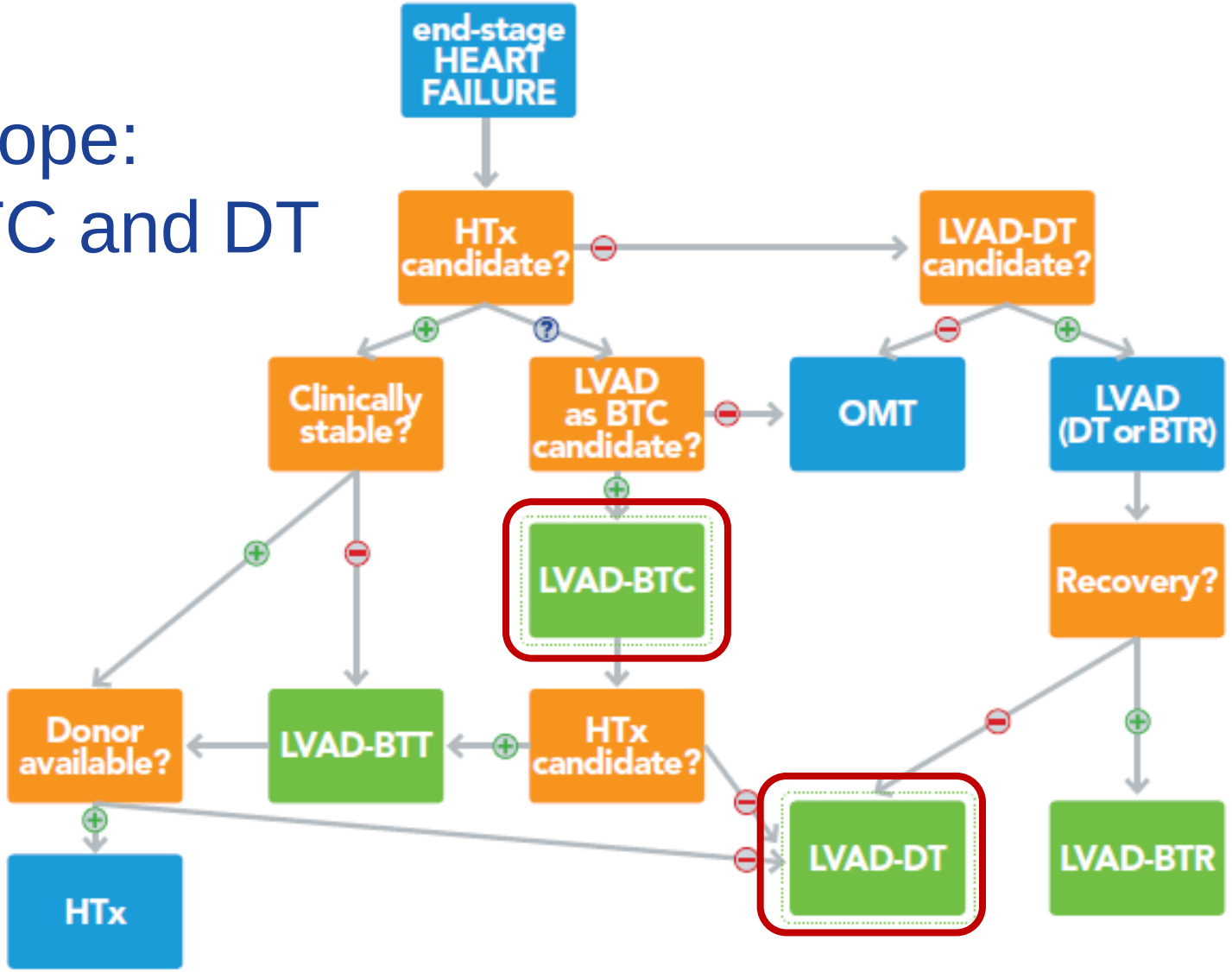




* OMT: Optimal medical treatment

Treatment intentions with LVADs

- Scope:
  BTC and DT



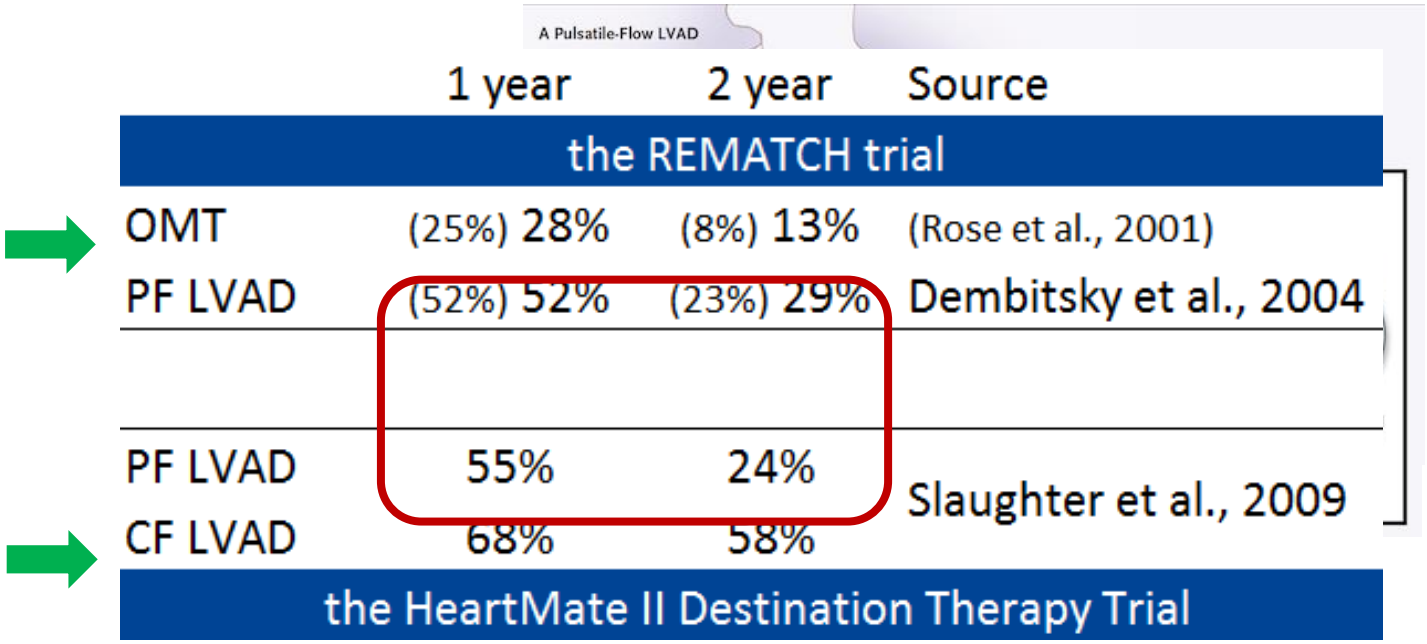
Research question

- Current situation:
  - 20 (1999) → 50 (2014) reimbursed LVADs/year
  - In recognised transplant centres (n=7)
  - Patients on Eurotransplant waiting list
  - Originally, only BTT → Since 1 July 2014 also BTC
- Research question:
  - >50 (DT, BTC)/year?

Note: BTT out of scope

Life expectancy

- Indirect comparison



A Pulsatile-Flow LVAD

	1 year	2 year	Source
the REMATCH trial			
OMT	(25%) 28%	(8%) 13%	(Rose et al., 2001)
PF LVAD	(52%) 52%	(23%) 29%	Dembitsky et al., 2004
PF LVAD	55%	24%	Slaughter et al., 2009
CF LVAD	68%	58%	
the HeartMate II Destination Therapy Trial			

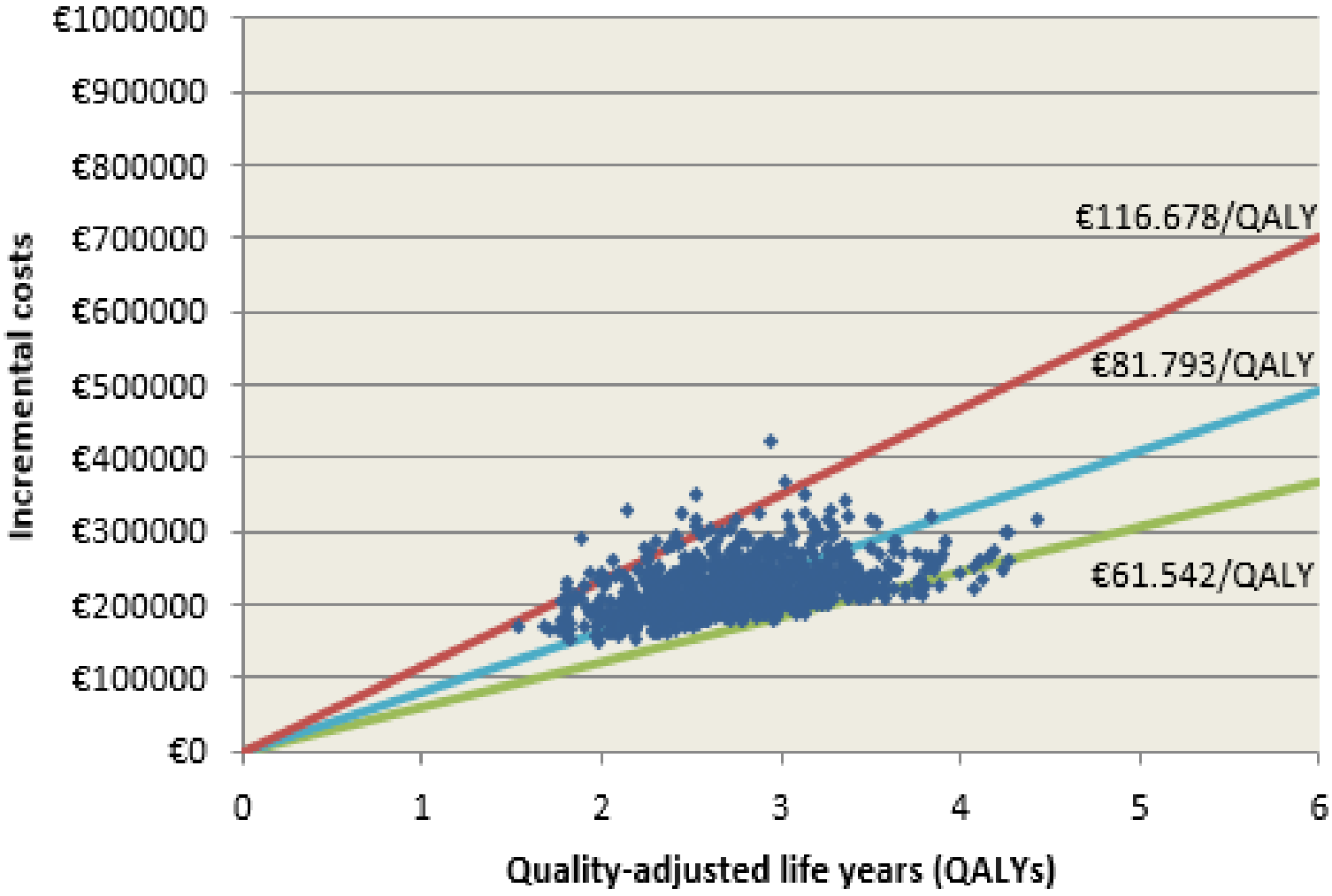
Complications & Quality of life

- Complications:
  - Bleedings (after the procedure, >30 days: 12 to 23%)
  - Cerebral infarction or cerebral haemorrhage (8-11% within two years)
  - Local infections (20-49%)
  - Sepsis (20-36%)
  - Residual right heart failure (5-25%)
  - Pump thrombosis
- QoL: improvement, but probably overestimated (Indirect comparison…)
  - OMT: 0.53
  - DT LVADs: 0.72 → >50% missing (at random??)

Cost-utility analysis

- LVAD (non-)discounted
  - Life expectancy: (4.82) 4.46
  - QALYs: (3.46) 3.19
  - Costs: €239 000
    - €46 000 (initial intervention) + €67 000 (device) + ~5% of their time rehospitalized
- Optimal medical treatment
  - Life expectancy: (0.82) 0.81
  - QALYs: (0.44) 0.43
  - Costs: €17 000 (underestimated → sensitivity analyses)

Cost-utility analysis



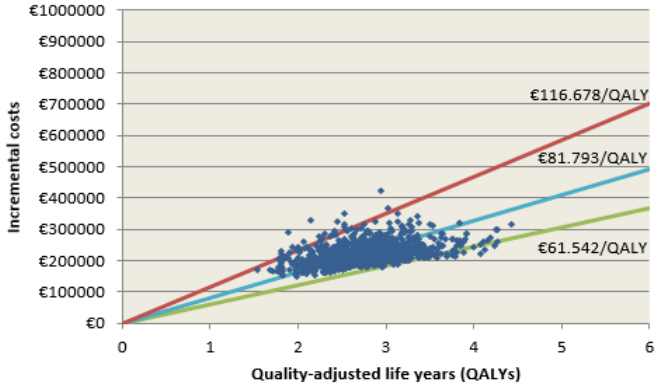
Limitations

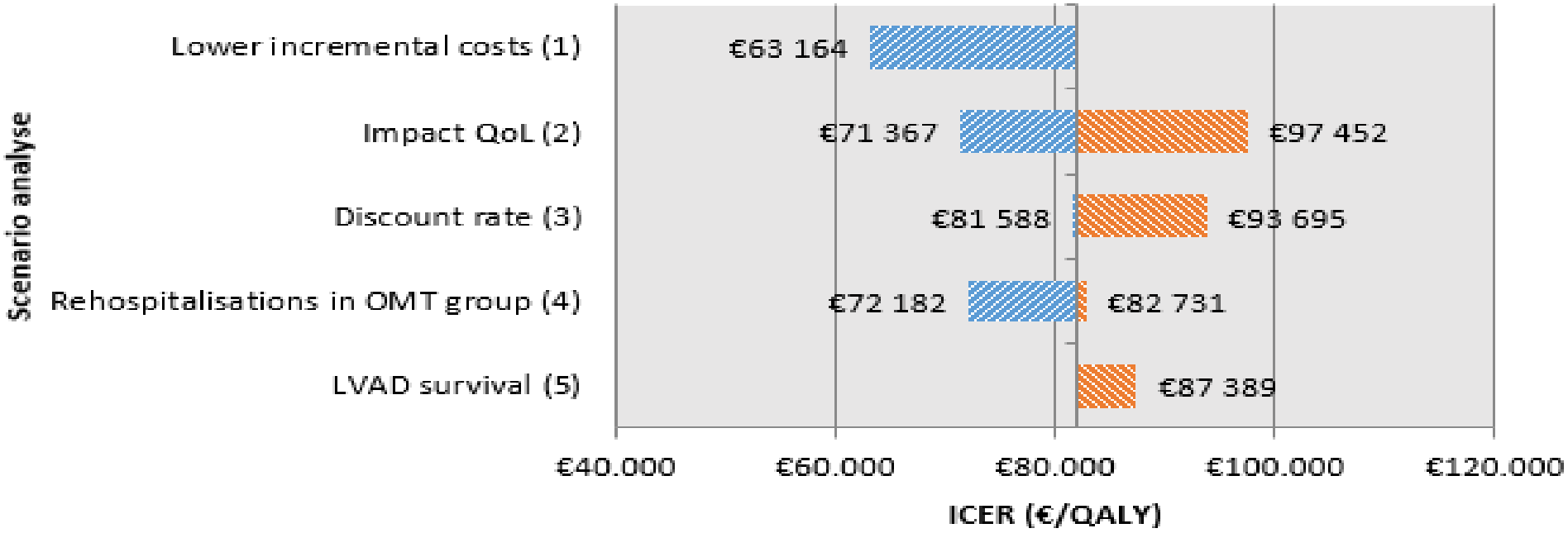
- Indirect comparison 
- Overestimation of costs in LVAD group (?), underestimation of costs in OMT group
- Overestimation of QoL in LVAD group
- Etc.

➔ Sensitivity analyses

(probabilistic & one-way scenario analyses)

Sensitivity analyses





And what about BTC?

- No evidence
- Increase of # LVADs (BTT, BTC or DT) will not increase # heart transplantations
- Increase of # LVADs as BTC (or as BTT) will only create more LVAD-DT patients

… and the cost-effectiveness of DT is not favourable.

Recommendation

To the Minister for Public Health and the competent bodies at RIZIV/INAMI:

A heart assist device as destination therapy results in a significant improvement in life expectancy and an improvement in the quality of life in comparison with optimal medical treatment.

Despite these clear benefits, the average cost effectiveness ratio is relatively high (€82 000 per QALY on average).

From a health economic point of view, there are no arguments for an extension of the reimbursement to more than 50 LVADs per year.

Colophon

- **Author(s): Neyt M, Leroy R, Devos C, Van Brabandt H.**
- **Publication date: 11/04/2016**
- **Domain:Health Technology Assessment (HTA)**
- **MeSH: Heart-Assist Devices; Heart Failure; Technology assessment, Biomedical; Cost-Benefit Analysis**
- **NLM Classification:WG 169.5**
- **Language: English**
- **Format: Adobe® PDF™ (A4)**
- **Legal depot: D/2012/10.273/29**

This document is available on the website of the Belgian Health Care Knowledge Centre.